



CABLING: WHY WIFI JUST WON'T CUT IT

In Our Experience: what's possible & effective

The last decade has seen the proliferation of wireless networks giving huge benefits such as constant data to phones and laptops that can roam around the house. Innovation is continuing apace. However, the unfortunate truth is that our radio spectrum is already very congested and the performance of many of these networks are hobbled (especially for city dwellers whose houses are saturated by competing signals).

As residential technology develops one of its keys tasks will be to deliver high definition video around the home. This may be, for instance, from TV sources, door entry or surveillance cameras and this video must be sent/received in a continuous stream. The stability of the connection and its overall speed is therefore crucial. Even the best of today's WiFi is 1/10th of the speed of a cabled connection when working at its best. Add more TVs to stream to, a visitor at the door and the WiFi network can quickly be overwhelmed and signals lost.

Some Fundamentals:

- **Cabling the Foundation:** the responsibility of the 'smart home' specialist lies in layering a robust WiFi infrastructure on top of a fast cable infrastructure to avoid these issues. Also, cable can make sure that future requirements can be catered for. A top-floor bedroom, for instance, may become a home office with dedicated telephone lines and full IT facilities and all of this should be as easy as plugging in some cables without any building work. Services such as telephony are some years from running over WiFi (and DECT handsets do not work well with large phone systems) and so cabling for them will also be vital.
- **Anticipating the Future:** it is vital, not just for the successful implementation of entertainment & 'smart home' systems in your immediate project design, to lay cable with an eye to the future and for your specialist to have an understanding of what is coming over the horizon as far as is practicable.
- **Standards:** by far the world's most common data connection is Cat5e, which is installed in most offices. Because of its enormous installed base, most manufacturers of high bandwidth video-over-data-cabling solutions design for Cat5e as their minimum specification. However, many practitioners of home technology suggest Cat6 should be used, as it has better shielding from interference (even cable is susceptible) and higher potential throughput. This is sensible advice in some installations where the larger diameter cable, wider bend radii and more complex terminations are not problematic. (So called Cat7 and Cat8 are not ratified standards and should be ignored.)
- **Intelligent vs Dumb WiFi:** an ordinary WiFi installation will comprise one or more access points that put out a 'pool' of reception - but each pool is unaware of its neighbouring WiFi networks and moving between them requires disconnection and reconnection. Intelligent WiFi utilises a central controller to actively manage a number of these 'pools' and allow roaming between them. Such systems are preferable if budget allows.

Things to bear in mind when evaluating this technology

- Careful planning of cabling infrastructure is vital at the earliest design stage (for fitting in 1st fix)
- WiFi networks demand throughput as a computer data stream - does this create its own complications?
- How many access points will be needed? Local WiFi conditions are unknowable until site is completed
- Is there much use of foil-backed plasterboard & structure steel in the building?
- Proper structured cabling systems require careful termination, labeling & testing or they are worthless
- How many competing types of RF will there be in the house: WiFi, DECT, Zigbee, Baby Monitors etc?